IN THE SPECIFICATION

Please rewrite the paragraph beginning on page 1, line 17, and ending on page 2, line 23, as follows:

Over the recent years, a two-way CATV system has been introduced, wherein not only a broadcasting device but also a two-way communication device are installed within a CATV center station of the CATV system, the CATV transmission ~~is~~ being structured as an optical coaxial hybrid transmission path composed of both ~~of~~ an optical fiber cable and a coaxial cable, and amplifiers for relay amplifications ~~are~~ being disposed in order to compensate for a loss of the transmission path in ~~a~~ broadband. The two-way CATV system is capable of transmitting upstream signals by utilizing a frequency band unused for transmitting downstream signals for a broadcast program, and services to promote a fusion of broadcasting services and communications services.

In the CATV system of which a main purpose is to provide the broadcasting services, a transmission quality of the downstream signals (a transmission band is, e.g., 70 MHz through 750 MHz) is managed. In the two-way CATV system introduced so far, however, with respect to upstream signals (a transmission band is, e.g., 10 MHz to 55 MHz), the usage thereof is limited to a data transmission of monitor signals of home terminals of subscriber homes, amplifiers on the CATV transmission path and power supply devices to the amplifiers, and to temporary utilization for relay transmission to a CATV center station from an event site, and hence a transmission quality thereof is not necessarily sufficiently managed at a high quality level with ~~a~~ stability.

In the case of utilizing the CATV transmission path for communications, it is of much importance to manage the upstream signals (up-signals) together with the downstream signals

(down-signals). In particular, an ~~importance~~ important factor for determining a quality of the two-way CATV system may be so-called ingress noises, in which the noises caused from within a multiplicity of amplifiers, tap-off lines and the subscriber homes, ~~become ingress~~ enter in the transmission band of the upstream signals.

Please rewrite the paragraph on page 9, lines 17-22, as follows:

According to the present invention, it is feasible to intentionally ~~eliminating~~ eliminate the non-linear circuit noises due to instability of contact of the passive elements of the coaxial connectors on the CATV transmission path by a breakdown effect, and hence the two-way CATV system exhibiting a high quality and ~~well~~ maintainability can be provided.

Please rewrite the paragraph on page 11, lines 14-26, as follows:

FIG. 1 shows a structure of a two-way CATV system in one embodiment of the present invention. Referring to FIG. 1, a CATV center station (head end) 1 is constructed of a broadcasting device (B)11 for frequency conversion, processing, and retransmitting RF signals derived from TV broadcasting ~~receiving~~ received via an antenna 10, and local origination broadcasting, etc., a two-way communications device (C)12 including a router and a switch for transmitting and receiving communications information (speech and data) to and from other networks 2 such as a public network, an appropriate network and the Internet, a multiplexer/demultiplexer (M/D) 13, and a optical transmitter/receiver (T/R) 15 including an electro-optic/opto-electric (E/O, O/E) converter 14.

Please rewrite the paragraph on page 12, lines 16-22, as follows:

The CATV transmission path 3 is composed of an optical coaxial hybrid transmission path in which an optical fiber cable 4 and a coaxial cable 5 are disposed in a tree structure. The bidirectional optical transmitter/receiver 6 is disposed at a node between the optical fiber cable 4 and the coaxial cable 5. The two-way optical transmitter/receiver 6 has an E/O, O/E converter 61.

Please rewrite the paragraphs beginning on page 14, line 7, and ending on page 15, line 2, as follows:

An RF signal source ~~RF~~ V_{RF} and an AC power source ~~AC~~ V_{AC} for bias superposition are provided in a left area of the equivalent circuit. Further, an RF signal terminating resistor Rt (normally, 75Ω) connected to a home terminal of the subscriber home and an unsubscribed terminal, is provided in a right area thereof. The terminating resistor Rt normally incorporates a series capacitance element C of approximately 1,000 pF in order to cut the direct current through the commercial ~~alternate~~ alternating current. Moreover, a load resistor Rb (1KΩ) connected in series to an inductance element L for cutting the RF signals and transmitting the ~~alternate~~ alternating current, is provided as a load of the bias current in parallel to the RF terminating resistor Rt.

The left half in FIG. 2 shows a VI characteristic of the equivalent circuit. A rightward oblique line indicates a voltage current characteristic of the connector contact resistance, and a bold cubic curve from the origin indicates a current rising characteristic of the parallel diode coupling. When the voltage drops of the diode contact resistance increases to some extent, the oxide layer falls into a breakdown, and the diode effect disappears. Hence, thereafter it turns out

to be a linear ~~contract~~ contact resistance characteristic when in a clean contact and therefore becomes a one-dotted chain line characteristic as shown in FIG. 2.

Please rewrite the paragraphs beginning on page 16, line 23, and ending on page 19, line 15, as follows:

Further, when ~~flowing~~ the DC bias ~~current,~~ current flows, as illustrated in an upper part of the VI characteristic, even if the above-mentioned breakdown of the contact resistance should not occur (in the case of an operation in a two-dotted line extending area of the VI characteristic), the RF signal is biased at a linear operating point apart from a non-linear area of the diode characteristic, and therefore an occurrence of the distortion noises decreases. As in the illustrated example, if the breakdown occurs, the linear contact is restored, and the occurrence of the distortion noises is improved.

[First Constructive Example of Obviating Ingress Noises]

FIG. 3 shows a first constructive example of obviating the ingress noises in the two-way CATV system illustrated in FIG. 1. Referring to FIG. 3, a commercial ~~alternate~~ alternating current (AC) voltage (normally, 40 V through 60 V) for supply to the amplifier is supplied from an output terminal of the amplifier at the terminal of the CATV transmission path 3, more specifically, the branch amplifier (BA) 8 or the line extender amplifier (EA) 9, and terminated by the RF terminating resistor (e.g., 75 Ω) having the resistor Rb for adjusting the bias current on the side of an output terminal of a branch tap-off TO.N at the end of the tap-off line TOL for diverging the downstream signals down to the individual subscriber homes 30. A power supply switching board PSC constituting a bias voltage superposing unit involves the use of a short bar SB.

Note that the reference symmetrical DCP designates a directional coupler, BT denotes a branch transformer, C represents a capacitor for cutting the direct current through the commercial ~~alternate~~ alternating current, and Rt denotes a terminating resistor normally having 75Ω in the configuration extending from a branch tap-off TO.1 to the branch tap-off TO.N.

In this RF terminating the inductor L is inserted in order that the bias current adjusting resistor Rb does not exert an influence upon 75Ω as a resistance value of the RF terminating resistor ~~RF.~~ Rt. When the bias current adjusting resistor ~~RB~~ Rb exhibiting a well high frequency characteristic is used, however, a synthesized resistance of the bias current adjusting resistor Rb and of the terminating resistor Rt may approximate 75Ω by omitting the inductor L.

According to this construction, ~~one~~ a single ~~of the~~ bias current adjusting resistor Rb is provided at the end of every tap-off line TOL, and hence the uniform current flows to all the coaxial connectors (marked with ◎ in the drawings of this invention) on the tap-off line TOL, whereby a fixed bias current ~~be~~ is supplied irrespective of a level of the signal along the tap-off line TOL. Accordingly, if the bias current is set corresponding to a maximum level of the branch output unit of the amplifier BA or EA, ~~the~~ effects more preferable than fixed can be all exhibited also in the level-down area of the tap-off line TOL.

[Second Constructive Example of Obviating Ingress Noises]

FIG. 4 shows a second constructive example of obviating the ingress noises in the two-way CATV system illustrated in FIG. 1. Referring to FIG. 4, the commercial ~~alternate~~ alternating current (AC) voltage (normally, 40 V through 60 V) for supply to the amplifier is supplied from the output terminal of the amplifier at the terminal of the CATV transmission path 3, more specifically, the branch amplifier (BA) 8 or the extension amplifier (EA) 9, and there are provided on the tap-off line TOL the tap-offs for diverging the downstream signals down to the

individual subscriber homes 30, i.e., the AC bias current adjusting resistors Rb connected in series to the inductance elements L for cutting the RF signals inwardly of the branch tap-off TO.1 through TO.M and a distribution tap-off DS as well. Note that the inductance element L may be omitted with the same design as that in the first constructive example.

According to this construction, if the given bias current adjusting resistors Rb ~~is~~ are provided in all the tap-offs TO, the bias current is maximized at the branch terminal of the branch amplifier BA or the output terminal of the line extender amplifier EA and diverges at every tap-off TO. Hence, the bias current is distributed stepwise along the tap-off lines TOL. This corresponds to the fact that the RF signal level attenuates along the tap-off line TOL, and therefore the bias current has a larger distribution as the RF signal level becomes higher.

Please rewrite the paragraph beginning on page 22, line 23, and ending on page 23, line 5, as follows:

The electric power supply switching board PSC is provided with a switch SW1 for selecting any one of the positive and negative voltages ~~is~~ selected in response to a control signal transmitted from the CATV center station 1, e.g., a control signal transmitted to the amplifier from the center station 1 when in a status monitor process, and outputting this selected voltage. The generated positive or negative voltage is superposed with the RF signal voltage and then transmitted to the tap-off line TOL, and supplied to the first or second RF terminating resistor shown in FIG. 3 or FIG. 4.

Please rewrite the paragraph on page 25, lines 4-12, as follows:

In this construction, the bias current is supplied corresponding to the necessity in terms of a quality management when there abnormally rises an absolute quantity of the ingress noises derived from the non-linearity of the contact portion of the coaxial connectors, and it is therefore possible not only to save the integrating consumption electric power but also to attain periodic batchwise cleaning to cause the breakdown in the contact portion at one time by ~~flowing~~ causing a large current to flow in a short time.

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Please rewrite the paragraph beginning on page 27, line 24, and ending on page 28, line 3, as follows:

FIG. 15 shows the inter-modulation distortion noises caused when ~~flowing~~ the AC bias current on the order of a milliampere flows to the tap-off line TOL, wherein the noise spectrum is considerably sparse. Further, if a level of the bias current is increased several times, as illustrated in FIG. 16, the noise spectrum exhibiting beard-like undulations disappears, and there exits only the noise floor of the thermal noises.

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